

WHAT IS CLAIMED IS:

- 1 1. A heat transfer apparatus comprising:  
2 a thermally conductive member including a base having one or more surfaces adapted to  
3 absorb heat from an electronic component and one or more surfaces extending from the base to  
4 radiate absorbed heat; and,  
5 a mounting assembly including at least one mounting member directly coupled to the  
6 base and for direct attachment to the electronic component so that loading forces for mounting  
7 on it the electronic component are not directly applied to the base.
- 1 2. The heat transfer apparatus of claim 1, wherein the thermally conductive member is a  
2 graphite-based material.
- 1 3. The heat transfer apparatus of claim 1, further comprising a compliant force applying  
2 mechanism mounted generally on the base for controlling forces applied on the base.
- 1 4. The heat transfer apparatus of claim 3, wherein the compliant force applying mechanism  
2 includes at least a biasing element, and a force applying actuator member.
- 1 5. The heat transfer apparatus of claim 4, wherein the biasing element is a coil spring is  
2 disposed about a shaft of the actuator member between lateral edges of the member and the top  
3 of the base, the actuator member comprises a pair of radially extending arms, each of which has  
4 an opening for receiving a threaded member which is received by the mounting assembly,

5 whereby by adjusting the threaded members, the actuator member can adjustably compress or  
6 relax the coil spring so as to adjust the force on the center of the base.

1 6. The heat transfer apparatus of claim 1, wherein the mounting assembly includes a pair of  
2 mounting members which are interconnected to each other by fastening assemblies, wherein the  
3 fastening assemblies extend through openings in the base.

1 7. The heat transfer apparatus of claim 6, wherein the mounting members include portions  
2 that are received within corresponding recesses of the base, and the portions allow direct  
3 attachment thereof to the electronic component.

1 8. The heat transfer apparatus of claim 6, wherein the mounting members are made of a heat  
2 conducting material.

1 9. The heat transfer apparatus of claim 7, wherein the mounting members have a generally  
2 L-shaped configuration.

1 10. A method of mounting a heat transfer apparatus to an electronic component, comprising:  
2 providing a graphite-based heat transfer apparatus including a base having one or more  
3 surfaces adapted to absorb heat from an electronic component and one or more surfaces  
4 extending from the base to radiate absorbed heat;  
5 providing a mounting assembly including at least one mounting member directly coupled  
6 to the base and for direct attachment to the electronic component; and,

7 mounting the mounting assembly which is coupled to the heat transfer apparatus directly  
8 on the on the electronic component so that loading forces for mounting it on the electronic  
9 component are not directly applied to the base.

1 11. The method recited in claim 10 further comprising the step of: applying compliant forces  
2 on the base by a compliant force applying mechanism mounted directly on the base.

1 12. The method recited in claim 11 wherein the compliant forces are applied by the  
2 compliant force applying mechanism using a coil spring that is centrally disposed about a shaft  
3 of an actuator member between lateral edges of the actuator member and the top of the base.

1 13. The method recited in claim 11, wherein mounting the mounting assembly to the base  
2 includes a pair of mounting members that are interconnected to each other by fastening  
3 assemblies, wherein the fastening assemblies extend through openings in the base.

1 14. The method recited in claim 13, wherein the mounting members include portions which  
2 are received within corresponding recesses of the base, and the portions allow direct attachment  
3 thereof to the electronic component.

1 15. A heat transfer system comprising:

2 a multi-chip module;

3 a graphite-based heat transfer apparatus including a base having one or more surfaces  
4 adapted to absorb heat from the multi-chip module and one or more surfaces extending from the  
5 base to radiate absorbed heat; and,

6 a mounting assembly including at least one mounting member directly coupled to the  
7 base and for direct attachment to the multi-chip module so that loading forces for mounting on it  
8 the multi-chip module are not directly applied to the base.

1 16. A heat transfer apparatus comprising:

2 a thermally conductive member including a base having one or more surfaces adapted to  
3 absorb heat from an electronic component and one or more surfaces extending from the base to  
4 radiate absorbed heat, the thermally conductive member is a graphite-based material; the  
5 surfaces extending from the base includes a plurality of thermally conducting elements;

6 a mounting assembly including at least one mounting member directly coupled to the  
7 base and for direct attachment to the electronic component so that loading forces for mounting it  
8 on the electronic component are not directly applied to the base, the mounting assembly includes  
9 a pair of mounting members which are interconnected to each other by fastening assemblies,  
10 wherein the fastening assemblies extend through openings in the base; and,

11 a compliant force applying mechanism mounted generally on the base  
12 in an area encompassed by the thermally conducting elements for controlling forces applied on  
13 the base; the compliant force applying mechanism includes at least a biasing element, and a force

14   applying actuator member, the biasing element extends between the actuator member and a top  
15   surface of the base.

1   17.    The heat transfer apparatus of claim 16, wherein the actuator member includes a shaft,  
2   the biasing element includes a coil spring in which the shaft is disposed, the coil spring extends  
3   between the actuator member and a surface of the base.

1   18.    The heat transfer apparatus of claim 17, wherein the actuator member includes a pair of  
2   radially extending arms, each of which has an opening for receiving a threaded member that is  
3   received by the mounting assembly, whereby the actuator member can adjustably compress or  
4   relax the coil spring so as to adjust the pressure on the base by adjusting the threaded members.